

Sub 3

[illegible]

a first step of forming, by a thermal chemical vapor deposition method, a silicon nitride film on an object disposed in a reaction container, with bis tertiary butyl amino silane and  $\text{NH}_3$  flowing into the reaction container, and

2. A semiconductor device manufacturing method as recited in Claim 1, further comprising said first step after said second step.

after repeating said first step predetermined times,  
said silicon nitride formed in said reaction container is  
removed, with  $\text{NF}_3$  gas flowing into said reaction container.

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before said silicon nitride formed in said reaction container has a predetermined thickness, said silicon nitride formed in said reaction container is removed, with  $\text{NF}_3$  gas flowing into said reaction container.

5. A semiconductor device manufacturing method as recited in Claim 1, wherein

before said silicon nitride formed in said reaction container has such a thickness as to generate particles on said object, said silicon nitride formed in said reaction container is removed, with  $\text{NF}_3$  gas flowing into said reaction container.

6. A semiconductor device manufacturing method as recited in claim 1, wherein

said reaction container itself is made of quartz and/or a member made of quartz is used in said reaction container, and

before a thickness of said silicon nitride formed on said quartz is increased to such an extent as to generate particles on said object,  $\text{NF}_3$  gas is allowed to flow into said reaction container to remove said silicon nitride formed on said quartz.

7. A semiconductor device manufacturing method as recited in claim 6, wherein

said second step is carried out in a state where a pressure in said reaction container is set to 10 Torr or higher.

8. A semiconductor device manufacturing method as recited in claim 1, further comprising a step of purging said reaction container using  $\text{NH}_3$  gas at least one of before and after said first step.

9. A semiconductor manufacturing apparatus comprising a reaction container, wherein

a silicon nitride film is formed, by a thermal chemical vapor deposition method, on an object disposed in said reaction container, with bis tertiary butyl amino silane and  $\text{NH}_3$  flowing into the reaction container, and

silicon nitride formed in said reaction container is removed, with  $\text{NF}_3$  gas flowing into said reaction container.

Add A3  
Add B5